

REMARKS

Claims 13-20, 22, 24, 25, 28-29 and 34 are rejected. Claim 13 has been amended. Claims 1-12, 20, 21, 26-27 and 30-33 are withdrawn from consideration. Claims 1-34 are presently pending in the application. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

In a telephone conversation with the Examiner on 10/11/06, it was clarified that claims 26 and 27 are withdrawn and claim 25 is not withdrawn.

The basis for the amendment to claim 13 can be found on page 6, lines 9-12 and page 8, lines 12-13.

Abstract:

The Examiner has objected to the abstract of the disclosure because of the embedded chemical structure. Applications have amended the abstract of the disclosure to comply with MPEP § 608.01(b) therefore, it is respectfully requested that this objection be reconsidered and withdrawn.

Information Disclosure Statement:

The Examiner states that the information disclosure statement filed 11/14/2003 fails to comply with 37 C.F.R. 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The copy of the Nature Biotech reference provided by applicant has missing pages.

A supplemental information disclosure statement and a complete copy of the Nature Biotech reference are attached pursuant to 37 C.F.R. 1.97(c). Applicants greatly thank the Examiner for considering the Diehl applications in full via their subsequent published applications.

Rejection Under 35 U.S.C. §102:

In section 6, the Examiner has rejected claims 13-15, 17-19, 22-25, 28 and 29 under 35 U.S.C. 102(b) as being anticipated by Bagchi et al. (US Patent 5,055,379).

The Examiner indicates that Bagchi et al. teaches, throughout the document and especially column 1, line 49, and figures 1 and 2, a photolithographic array comprising gelatin grafted particles (microspheres) loaded with a dye which are coated on a substrate. The Examiner further indicates that

Bagchi et al. teaches in column 41 under "cyan dye" a structure reading on the genus of Formula (I). The Examiner states that the gelatin of Bagchi et al. is taken as the same as set forth in claim 14, the particles comprise chemically reactive sites and that various substrate materials including glass and poly(alkyl methacrylates) which are flexible may be utilized. The Examiner indicates that the reference teaches the particles as having a diameter of 10,000 nm, and therefore, absent evidence to the contrary 1,000,000 particles are present per square cm, therein reading on the concentration of 100-1,000,000 microspheres per square cm. The Examiner further indicates that Bagchi et al. teaches that following gelatin grafting to the particles, the mixture is immobilized by photo crosslinking on a substrate, the dye sites on the particles are capable of crosslinking and represent an organic moiety connected to an inorganic bichromate species. The Examiner states that the particles shown schematically in figure 2, are randomly distributed, and the array is prepared on a flat surface which does not bear sites capable of physical or chemical interaction with the particles. This rejection is respectfully traversed for the following reasons.

Bagchi et al. teaches a negative-working photoresist composition comprising dye-loaded or dye-precursor-loaded polymeric particles individually covered with a layer of gelatin and a radiation-sensitive dichromate that is useful in the preparation of continuous tone dyed imaging elements such as color filter arrays for use in solid state color image sensing devices. The composition reduces image swelling and prevents dyes from migrating between contiguous filter layers.

The present invention relates to a microarray comprising a substrate coated with a composition comprising a gelling agent or a precursor to a gelling agent and microspheres that contain dye. The microspheres do not substantially fluoresce when excited by visible light, and are immobilized on the substrate.

A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim.

Bagchi et al. discloses gelatin grafted particles loaded with a dye. However, the reference fails to disclose low fluorescing microspheres containing a

dye of Formula (I) as claimed by the present invention as amended. The reference fails to disclose microspheres that do not fluoresce as claimed by the instant invention. Additionally, low fluorescence is not an inherent property of the compounds disclosed by the reference. Bagchi et al. discloses a broad range of suitable compounds, such as those listed on column 26, lines 46-49 and claim 10 including; azo anilines, azo pyridines, azo pyrazolones, merocyanines, methines, arylidenes, quinonimines, anthraquinones, naphthoquinones and quinonaphthalones. Although some compounds classified within this group may be low fluorescing, there is no indication that this property is inherent throughout the broad disclosure of compounds disclosed by the reference. The fact that a certain characteristic may be present in the prior art is not sufficient to establish the inherency of that characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). There are no general guideline parameters with which a colorant scientist may predict the fluorescence of any given colorant material. Therefore, the colorant scientist must undertake an empirical approach to the discovery of colorant materials that are non-fluorescent.

In fact, many of the compounds listed within Bagchi et al. demonstrate the property of high fluorescence, and would not be suitable for use in the instant invention. Applicants kindly direct Examiners attention to the following examples. Parton et al. (US Patent 6,620,581) discloses merocyanine dyes, similar to those discussed in Bagchi et al., that are highly fluorescent (column 9, line 25 through column 10, line 44; claim 1; and claims 21-23). Tsien et al. (US Patent 7,115,401) teaches cyanine dyes that are fluorescent (column 16, lines 43-46 and column 17, line 50 through column 18 line 7). Licha et al. (US Patent 6,630,570) discloses dyes with a high fluorescence (column 2, line 24-29), including merocyanine (column 3, lines 58-63). Additionally, please see **Exhibit A** attached pursuant to 37 C.F.R. 1.132, comparing CD-1 of the instant invention with dyes B-1 (column 27) and D-4 (column 31) of Bagchi et al. Both dyes B-1 and D-4 demonstrate significant fluorescence while CD-1 exhibits no detectable fluorescence. Bagchi et al. discloses a broad category of suitable dye compounds,

some of which are highly fluoresce. Therefore, the reference does not expressly or inherently disclose all of the claimed limitations of the instant invention.

Claims 14, 15, 17-19, 22-25, 28 and 29 benefit from dependency on claim 13, which as discussed above is patentable.

Since Bagchi et al. does not set forth each and every element as set forth in the claims of the present invention, and does not expressly or inherently describe in as complete detail the claims of the present invention, the reference fails to anticipate the instant invention. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

Rejection Under 35 U.S.C. §103(a):

In section 7 the Examiner has rejected claims 13-19, 22-25, 28 and 29 under 35 U.S.C. 103(a) as being unpatentable over Bagchi et al. (US Patent 5,055,379) in view of Chrisey et al. (1996 Nucleic Acids Research 24:3040-3037).

The Examiner indicates that Bagchi et al. does not teach bioreactive chemically surface active sites capable of interacting with a nucleic acid. The Examiner further indicates that Chrisey et al. teaches, throughout the document and especially figure 1, chemistry for loading a surface with oligonucleotides capable of hybridizing with fluorescently labeled complementary strands. The Examiner states that it would have been prima facie obvious for one of ordinary skill in the art, at the time the claimed invention was made, to utilize the oligonucleotide surface chemistry per Chrisey et al. with the array comprising gelatin grafted particles loaded with a dye which are coated on a substrate per Bagchi et al. The Examiner further states that one of ordinary skill in the art would have been motivated to use the oligonucleotide surface chemistry with the array comprising gelatin grafted particles loaded with a dye which are coated on a substrate because it would provide more distinct features, via less "dye wandering." The Examiner states that one of ordinary skill would have had a reasonable expectation of success using the nucleic acid surface chemistry with the array comprising gelatin grafted particles loaded with a dye which are coated on a substrate because both photolithography and immobilization of oligonucleotides is well established in the art. This rejection is respectfully traversed.

Bagchi et al. teaches a negative-working photoresist composition comprising dye-loaded or dye-precursor-loaded polymeric particles individually

covered with a layer of gelatin and a radiation-sensitive dichromate that is useful in the preparation of continuous tone dyed imaging elements such as color filter arrays for use in solid state color image sensing devices. The composition reduces image swelling and prevents dyes from migrating between contiguous filter layers.

Chrissey et al. relates to the formation of patterned DNA species on a substrate by use of a UV lamp.

The present invention relates to a microarray comprising a substrate coated with a composition comprising a gelling agent or a precursor to a gelling agent and microspheres that contain dye. The microspheres do not substantially fluoresce when excited by visible light, and are immobilized on the substrate.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

As discussed above, Bagchi et al. fails to teach or suggest the use of low fluorescing microspheres as claimed by the instant invention. Chrissey et al. also fails to teach this limitation. Additionally, Chrissey et al. is non-analogous art. Chrissey et al. relates to patterning silane films and does not relate to dye filled microspheres or microarrays. There is no motivation disclosed within the reference to suggest combination as the reference fails to teach any matter relating to microarrays or dye filled microspheres.

As discussed above, there are no general guideline parameters with which a colorant scientist may predict the fluorescence of any given colorant material. Therefore, the colorant scientist must undertake an empirical approach to the discovery of colorant materials that are non-fluorescent. The present invention provides surprising results, as dye materials containing a specific halogen functionality are particularly likely to possess the property of very low fluorescence. As indicated on pg. 20, Table I of the specification, the presently claimed dyes of Formula I are low fluorescing, when compared to other, similar dyes.

No reference, alone or in combination, teaches or suggests a microarray comprising microspheres containing dye that does not substantially fluoresce when excited by visible light as claimed by the instant invention. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

Rejection Under 35 U.S.C. §103(a):


In section 8 the Examiner has rejected claims 13-15,17-19,22-24,28, 29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bagchi et al. (US Patent 5,055,379).

The Examiner indicates that Bagchi et al. teaches in column 41, a structure which is virtually identical to elected species CD-1. The Examiner states that there is a presumed expectation that such compounds possess similar properties. This rejection is respectfully traversed.

As discussed above the instant invention provides surprising results. The claimed invention and the prior art must each be viewed "as a whole." *In re Langer*, 465 F.2d 896 (CCPA 1972). Bagchi et al. discloses a broad range of suitable compounds, and as discussed above some of these compounds exhibit high fluorescence. The instant invention is limited to compounds that exhibit low fluorescence. There are no general guideline parameters with which a colorant scientist may predict the fluorescence of any given colorant material. Therefore, the colorant scientist must undertake an empirical approach to the discovery of colorant materials that are non-fluorescent. It is respectfully requested that this rejection be reconsidered and withdrawn.

It is believed that the foregoing is a complete response to the Office Action and that the claims are now in condition for allowance. Favorable reconsideration and early passage to issue is therefore earnestly solicited.

Respectfully submitted,


Attorney for Applicant(s)
Registration No. 42,334

Lynne M. Blank/ct
Rochester, NY 14650
Telephone: 585-477-7418
Facsimile: 585-477-1148

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.